

Claims

1. An apparatus for detecting cellular response following exposure to an agent, the apparatus comprising:
  - a) a plurality of recording chambers each adapted to receive and support a cell;
  - b) a plurality of video cameras, one video camera positioned for viewing a single recording chamber;
  - c) a video switching mechanism for controlling a video camera input source selection to a video monitor;
  - d) a perfusion system adapted to perfuse a cell positioned in a recording chamber with a predetermined set of perfusion solutions;
  - e) at least one invasive biosensor adapted for use with each recording chamber, the at least one invasive biosensor being controllable using computer-controlled electronic micromanipulators; and
  - f) a computer adapted to monitor recording chambers, manipulate a biosensor, collect, analyze and display responses detected using the biosensor.
2. The apparatus of Claim 1 wherein the cell is a mammalian, insect or amphibian cell.
3. The apparatus of Claim 2 wherein the cell is a *Xenopus* oocyte.
4. The apparatus of Claim 1 wherein the biosensor is an electrode.
5. The apparatus of Claim 4 wherein the electrode is a voltage measuring or a current injecting electrode.

6. The apparatus of Claim 1 wherein the perfusion system comprises a plurality of reservoirs containing one or more different perfusion solutions, and a valve in fluid communication with said plurality of reservoirs for the delivery of perfusion solution to a recording chamber.
7. The apparatus of Claim 1 further comprising a means for controlling the temperature of each recording chamber.
8. The apparatus of Claim 1 further comprising means for controlling the oxygen, nitrogen or carbon dioxide levels in a recording chamber.
9. The apparatus of Claim 1 wherein the response of the cell to the agent is mediated by a cell surface receptor produced by recombinant DNA technology.